Photonuclear Inspection and Threat Assessment System

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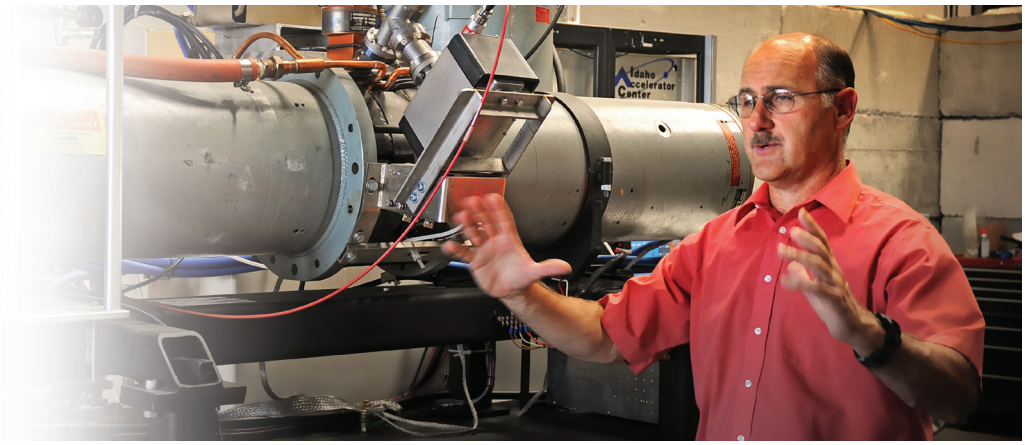

INL's Dr. James Jones explains how PITAS uses high-energy photons to help detect nuclear materials.

Every day along sunny beaches and frigid shorelines, the U.S. receives hundreds of thousands of cargo containers. Most are the size of a rail car and contain a surplus of products ranging from clothing to electronics. But, they could also carry contraband items like drugs, explosives, or illicit radiological and nuclear materials.

Since 9/11, detecting smuggled nuclear items has become a top homeland security priority. Traditionally, the detection process involves scanning every container as it is off-loaded on the dock. This process is time-consuming and inefficient, often yielding false positive alarms.

But detection research currently taking place at Idaho National Laboratory (INL) has shown promising results for increasing the accuracy and detection distance of nuclear materials. The research is proving that detection can take place before a cargo container even comes close to the 95,000-mile U.S. maritime border.

INL engineers have developed and tested the Photonuclear Inspection and Threat Assessment System (PITAS). This nonintrusive technology employs a transportable high-energy linear electron accelerator to channel high-energy photons into a precise invisible beam that inspects the cargo containers. If nuclear materials are present, fission is induced, and gamma and neutron signatures are emitted.

Using a series of patented INL detectors and a computer algorithm, the signatures are analyzed for illicit characteristics. The PITAS process also allows detection of material that has been covertly shielded. PITAS has software that can detect plutonium, uranium, and thorium.

Quick Facts

- The PITAS technology detects radiological and nuclear material in less than 2 minutes at distances more than 100 meters.
- Operates remotely using a high-energy 8-30 MeV accelerator.
- Controls dose on target with a built-in collimator and accelerator operation.
- Leaves no lasting impact or residue signature.
- The system's design leaves no lasting environmental effects and can be easily transported.

For More Information

Daren Norman
(208) 526-3953
daren.norman@inl.gov

Idaho National Laboratory

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